



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/712,749	11/14/2000	Chia-Yu Fu	CT00-020	9765

23330 7590 08/26/2002

MOTOROLA, INC.  
CORPORATE LAW DEPARTMENT - #56-238  
3102 NORTH 56TH STREET  
PHOENIX, AZ 85018

EXAMINER

NGUYEN, DAVID T

ART UNIT PAPER NUMBER

3723

DATE MAILED: 08/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/712,749

Applicant(s)

FU ET AL.

Examiner

David Nguyen

Art Unit

3723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25 is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**Office Action Summary**

Application No.

09/712,749

Applicant(s)

FU ET AL.

Examiner

David Nguyen

Art Unit

3723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 25 is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. In view of applicant's arguments filed July 18, 2002, claims 1-25 will be examined in the instant application. Claims 26-32 are withdrawn from consideration as being to a non-elected invention.

#### *Specification*

2. The disclosure is objected to because of the following informalities:
- a. Numeral "20, page 6, line 12, does not appear in figure 3.
  - b. The reference character "40 " has been used to designate both "supporting substrate 40", page 13, line 4 and "entire board 40", page 16, line 6.

---

Appropriate correction is required.

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4; 6; 8-10; 13-15; 17-20 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kubota et al (5,644,107).

Kubota et al discloses a method of fabricating a low profile integrated module.

Kubota et al discloses a first sheet of material defining two adjacent integrated module first components 10, and forming a via extending through the first sheet between the two adjacent

Art Unit: 3723

integrated module first components 18, 19; filling the via with a conductive metal; providing a second sheet of material 17 defining two adjacent integrated module second component; fixing the first and second sheets in overlying relationship with the two adjacent integrated module first component aligned with the two adjacent integrated modules second components to form two adjacent integrated modules fig. 2; cutting the first and second sheets (column 5, line 36); through the via to separate the first and second sheets into separate integrated modules, each module having a portion of the via filled with conductive metal (column 6, line 9) in a periphery thereof and extending along a portion of the periphery fig. 3. Kubota et al also disclose the sheets of printed circuit boards 31 conductive metal includes filling the via with a solder paste, providing sheets of unfired ceramic material, partially overlapping, holes to define a single via with an elongated cross section (column 7, lines 61-63)

Kubota et al also discloses a plurality of first sheets of material each including a via extending therethrough and a plurality of second sheets of material 10, fixing the first and second sheets in overlying relationship (fig 2), firing the unfired sheets (column 6, line 43), and the connection pad (figs. 5, 6).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota at al in view of Shigemi at al '334.

Kubota et al is explained above. Kubota et al also discloses the sheets of unfired ceramic material, but do not disclose the sheets of  $Al_2O_3$  and glass particles(claim 5). However, with reference to column 2, lines 37-47, Shigemi et al discloses “ glass powder such as a  $CaO$ ,  $Al_2O_3$ ,  $SiO_2$  .... comprising a binder, a plasticizer, and solvent, may be used”. Shigemi et al enriches the process by providing more and difference types of material for the process. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Kubota et al by providing the sheets of unfired ceramic material to include sheets  $Al_2O_3$ , glass particles and a binder of in view of the teachings of Shigemi to thereby enrich the process.

Kubota et al do not disclose a conductive metal with a melting temperature greater than the firing temperature (claim 7). However, with reference to column 3, lines 19-54, Shigemi et al discloses “ the conductive paste has a sintering (melting) temperature higher than that of the green sheet”, in order to prevent the conductive paste from melting and leaking out of the holes in the process of firing of the green sheets. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Kubota et al by providing a conductive metal with a melting temperature greater than the firing temperature in view of Shigemi in order to prevent the conductive paste from melting and leaking out of the holes in the process of firing of the green sheets.

7. Claims 11, 12, 21, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al.

Kubota et al is explained above. Regarding claims 11 and 21, Kubota et al discloses the pluralities provided result in the common via, but Kubota et al does not disclose in detail

“the extending in a range from approximately ...an upper sheet”; however; figs 5 and 6.

Regarding claims 12 and 22, Kubota et al discloses forming a hole, but does not disclose in detail a cross sectional dimension range of approximately 125-to 500 um. However, the exact dimensions of the product would have been an obvious matter of design choice to one having ordinary skill in the art, since such modifications would have involved a mere change in the size of the design. It should be noted that a change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

#### *Allowable Subject Matter*

8. Claims 16, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 25 is allowed.

#### *Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nakamura et al discloses a method of manufacturing a ceramic substrate.

Farooq et al discloses a method of selectively depositing a metallic layer on a ceramic Substrate.

Bergstedt discloses a process for manufacturing a multi-layer circuit board with supporting layers of different materials.

Art Unit: 3723

Ryan discloses multi-layer circuit board techniques.

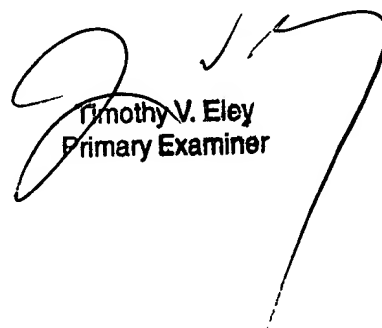
Sakai discloses a multi-layer electronic component and a method of manufacturing the same.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Nguyen whose telephone number is 703-305-5712. The examiner can normally be reached on 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hail can be reached on 308-2687. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0000.

tdn  
August 13, 2002

  
Timothy V. Eley  
Primary Examiner